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NOTES
ON
HOSPITALS IN NORTHERN ITALY,
AND ON
PELLAGRA.

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(From the British and Foreign Medico-Chirurgical Review for January, 1863.)

NOTES ON HOSPITALS IN NORTHERN ITALY, AND ON PELLAGRA.

THE following observations are compiled from notes made during a short tour in the North of Italy in the month of September last.

The Hospital of San Servolo at Venice is situated on an island in the Lagune, near the Armenian Convent of San Lazare, and midway in the channel between Malamocco and Lido. It is appropriated to the reception of lunatics of the male sex, and is under the charge of monks of the order of San Giovanni di Dio. The superintendent and some of the brethren are medical men, and receive their education at the Hospital of the order in Padua, and at the University of that city.

The whole island is occupied by the establishment, and the buildings of the hospital are arranged around small courts opening from a long corridor. The convalescent and epileptic patients sleep in dormitories containing a large number of beds, but the more violent and dangerous patients are placed in cells containing two beds each. The beds are of iron, and some of them are fixed in the floors. The floors of the wards and corridors are of the usual polished concrete common in Italian houses, and are wide, high, and well-ventilated, and stoves are provided for warming in winter.

The whole establishment was scrupulously clean, and apparently under extremely good management. I did not observe any patient under restraint, nor any chairs or other appliances for restraint. A padded room was shown, but it was stated to be seldom used, and this was confirmed by its being evidently a receptacle for lumber. Patients in active excitement were, however, by themselves in several of the cells, but a large number of the more dangerous class were together in a large day room, and had apparently only one attendant, though my conductor informed me that he supposed that there was scarcely one of them who had not killed some one. In the establishment there are workshops in which the shoes and clothes of the patients are made, and also carpenters' and smiths' shops, in all of which several persons were at work, and I understood that in each all were patients except the superintendent. The kitchen work is also entirely done by the patients, under the direction of the cook. There are several airing grounds provided, in which the different classes of patients were

amusing themselves; and in connexion with them a raised alcove, commanding a view of Venice and the Lagune. Throughout the patients were orderly, and apparently in excellent discipline, though they were perhaps more noisy than those of an English asylum.

In the office I was shown the reports of the several cases under treatment carefully recorded, both at the time of their admission and subsequently. Two carefully compiled statistical reports were also given to me—one of these records the movement of the patients for the ten years, from 1847 to 1856 inclusive, the other for the quinquennial period, 1857 to 1861. From these reports it appears that the total number of patients under treatment in the fifteen years was 3617, and the deaths 1178, giving a rate of mortality of 32·5 per cent. The mean number of patients resident during the last five years was 343, and the mean number of deaths 75 per annum, giving a rate of mortality calculated upon the residents of 21·8 per cent. During the last five years the total number treated was 1314, the deaths 377, and the rate of mortality 28·7. Of this number, however, 411 were cases of pellagra, and the deaths in this form of insanity were 133, reducing the rate of mortality in the other cases to 27·02 per cent.

The hospital is capable of accommodating about 360 patients, and the total number treated in 1861 was 567. I saw several cases of the melancholia following pellagra. At the time of my visit the director was from home, but every attention was shown by the brethren who conducted me over the establishment, and I only regretted that from my not speaking Italian our means of communication were so limited.

The library of the establishment consists chiefly of French works on insanity, and of Latin and Italian theological treatises. I did not observe the works of any English author, though I was told that the superintendent understood our language. Altogether the establishment produced a favourable impression on my mind, and I was much gratified with the urbanity of the monks in charge of it, and their evident earnestness in the work in which they were engaged.

The Spedale Civile at Venice is situated near the Church of San Giovanni e Paolo. It consists of the buildings formerly appropriated to a religious order which devoted itself to the care of the sick and poor in the city, the Scuola di San Marco, and dates from about 1485. It was appropriated to its present purpose after the fall of the republic. The entrance is through a wide and high hall, with marble floors and columns, and the wards are grouped around small courts, and occupy two floors, with open loggias or corridors. The wards are large, wide, and high, but had a crowded appearance at the time of my visit, one of the largest being under repair, and the patients being consequently placed in four rows in the other wards; the superficial space was thus deficient, though, doubtless, from the great height, the cubic space would be large. The establishment then contained about 700 patients, but it is capable of receiving fully 1500. In the larger wards the beds must have been upwards of 100. The neighbouring Church of San Giovanni e Paolo, well-known to tourists, is

employed as the chapel of the hospital. The cases treated in the hospital consist of ordinary medical and surgical cases, eye cases, &c. There are also obstetric wards, and wards for the diseases of women, and for female lunatics. The mass of cases at the time under treatment consisted of endemic fever, intermittent, remittent and miliary, cases of pellagra, and ordinary chronic cases.

In the post-mortem rooms, examinations of a Fallopian tube gestation at about the sixth week, and of a case of cardiac and aortic disease, were in progress.

The Spedale Civile or Spedale Clinica at Padua is a building of comparatively recent date, having been erected on the site of a suppressed convent of Jesuits in 1798. It consists of a plain building erected around a large central court and a smaller one on each side, laid out as gardens. It occupies two floors with open loggias on the garden sides. The lower floor is devoted to the wards under the charge of the university professors. These are of small size, containing ten or twelve beds each, and are appropriated to the ordinary classes of cases—to eye affections, &c.; and as obstetric wards. The upper floors are chiefly occupied by two very large wards, on one side and at the end of each smaller court, appropriated to ordinary medical and surgical cases. These wards cannot contain each much less than one hundred beds, and are very wide and high.

The hospital also contains the pathological museum of the university, but this did not appear to be either extensive or important. The most numerous preparations were specimens of diseased bone, and there were also some visceral preparations in spirit. The cases which I saw under treatment were similar to those at Venice.

In the University the dissecting rooms are well arranged and are light and airy, and there is an anatomical museum attached to them. What is, however, of much greater interest is, that the theatre, still employed for anatomical demonstrations, is that built under the superintendence of Fabricius ab Aquapendente, in 1564. It consists of a small oval chamber opening below into the dissecting-room. The lower part is just large enough to admit an ordinary-sized dissecting-table, with space for the demonstrator to walk round it. From this level six rows of narrow standing-places rise rapidly one above another, so that from the top row there is a good view directly down to the table. The theatre is lighted from above.

The Spedale Maggiore at Milan is probably the most magnificent establishment of the kind in Europe. It was founded in 1456, by Francesco Sforza, and, though not completed according to the original design, affords magnificent façades both externally and on the inner side. It consists of a pile of buildings two stories high, surrounding a large square courtyard in the centre and smaller ones at the sides. Externally there are rounded arches surrounding windows in the pointed style, with carved mouldings and statues; around the courtyard there are wide open loggias, supported on columns and arches, and from these the wards are entered. The arrangement is very similar to that of the hospital at Padua, but the wards, instead of being single, are

divided down the centre, so that though very high they are narrow and have a crowded appearance. Indeed, for such a climate, the cubic space is not sufficient, and the wards having windows only on one side, cannot be properly ventilated. The cases in the wards at the time of my visit consisted chiefly of malarious affections, and of what was termed miliary fever. This seemed to consist of remittent fever with a miliary eruption. In some cases I was told that it was attended by dryness of the tongue and cerebral symptoms, and then was called typhoid. There were also midwifery cases, and lunatics, both male and female located in the hospital, and both in the general and insane wards I saw numerous cases of pellagra. I observed in this hospital, as also at Venice and Padua, that the title of the disease was always placed in large letters over the bed, a plan which might be advantageously copied in our own hospitals. Shops are provided in the hospital for manufacturing most of the articles required for the attendants and patients.

The establishment is capable of accommodating about 2000 patients, and contains ordinarily from 1600 to 1700. In 1840, when visited by M. Cerfberr, on account of the French Government, it contained 1712. In 1842 the total number of patients under treatment was 21,019, and during the eleven years, from 1832 to 1842 inclusive, the numbers ranged from 15,578 to 23,077.

This hospital appeared in a less satisfactory state than the others visited. There was less attention to cleanliness and comfort, and among the lunatics several were secured to their beds and to chairs by iron apparatus. Probably the establishment is too large for efficient discipline and control.

The medical charge of the patients in all the hospitals named is placed in the hands of physicians and surgeons practising in the towns and of junior medical officers, who reside upon the spot. The general superintendence is vested in a director, who is a qualified medical man. The nurses are sisters of charity, and I met with several who were intelligent and well educated, speaking both French and Italian. The funds for the maintenance of the establishments are derived partly from the original foundations, partly from the revenues of suppressed convents, and in some—as in the hospitals of Venice, where the funds were vested in the State and have been forfeited—a charge is made for the maintenance of the patient on the town or district in which he resides, if it can be ascertained; if not, the expense is charged to the municipality of the city. In the hospital at Munich, also visited in the autumn, I found that a tax was levied upon all unmarried adults resident in the town, and this entitles them to the benefits of the institution when ill. In all the establishments it appeared that the only requisite for admission was that the patient should be in need of medical assistance; and in some, as at Munich, any one wishing to be admitted can enter the hospital on paying the expenses of his maintenance and treatment.

The special object of my visits to the Italian hospitals was, however, to have the opportunity of seeing cases of Pellagra.

PELLAGRA.

In 1775 M. Chomel, Dean of the Faculty, published at Paris an account by M. Thierri,* of a remarkable disease observed by that gentleman in Spain during the time that he was attached to the French embassy. M. Thierri states that this disease was endemic in the mountains of the Asturias, and was shown to him by M. Cazal, at Oviedo. It was regarded as a species of leprosy, being characterized by an eruption on the skin and constitutional symptoms, and had been known in the district for twenty-five to thirty years under the name of "Mal de la Rosa." In 1786 and 1787, Mr. Townsend, an English clergyman, travelling in Spain,† had his attention drawn to the same disease in the hospital at Oviedo. About 1770, Antonio Pujati is said to have described at Padua a disease met with amongst the peasantry in Upper Lombardy under the name of "Scorbuto Alpino." In 1771, Francesco Frappoli‡ published an account of a disease prevalent in the Milanese, to which the name pellagra was given. In 1776, Odoardi§ noticed the occurrence of a similar affection at Belluno; and in 1778 further accounts of the disease were published at Leyden by Jansens,|| and at Nuremberg by Zanetti,¶ who had observed it in the hospitals at Milan. In 1784, the affection had become so common that a hospital was established at Legnano, in the neighbourhood of Milan, for the reception of pellagrose patients. This was placed under the medical charge of the elder Strambio, whose work appeared two years after.**

In 1789, Francesco Fanzago,†† then a young practitioner just returned from Pavia, but subsequently a professor in the university, published at Padua his opinion that the diseases described by Frappoli and which he had seen in the Milanese, and that which prevailed in the Venetian provinces, were the same. This view, much contested at the time, subsequently became general, and the term pellagra was employed to designate the disease.

After this various works were published on the subject. Those of Soler and Della Bona appeared at Venice in 1791;‡‡ and Titius published a paper at Leipzig in the following year.§§ In 1794, Careno|||| described the disease in a small volume which appeared at Vienna; and in 1807, Cerri, who had been appointed by the government of the kingdom of Italy to investigate the disease, published the first volume of his work.¶¶ In 1817, Dr., now Sir Henry, Holland contributed to

* Recueil Périodique d'Obs. de Méd. de Chir. et de Ph., tom. ii. p. 336. Paris, 1775. The observations of M. Thierri were afterwards published in his Obs. de Phys. et de Méd., faites en differens lieux d'Espagne, tom. ii. p. 136. Paris, 1791.

† A Journey in Spain, vol. ii. p. 10. London, 1792.

‡ Giuseppe Cerri: Trattato della Pellagra, p. 78. Milano, 1807.

§ Cerri: op. cit., p. 86.

|| De Pellagra morbo in Mediolanensi ducatu endemio.

¶ Nov. Act. Méd. Phys. tom. vi. p. 118, obs. xxiv., Aprilis, 1775.

** Cerri: op. cit., p. 143.

†† Ibid., p. 227.

‡‡ Ibid., pp. 247, 273.

§§ Ibid., p. 282.

|||| Tentamen de Morbo Pellagra.

¶¶ I have only seen the first volume of this work, of which copies exist both in the Library of the Medico-Chirurgical Society and of the Royal College of Surgeons.

the 'Medico-Chirurgical Transactions' an able and interesting account of pellagra as he had observed it in the hospitals of Italy.

In 1829, M. Hameau* described a peculiar disease as occurring among the peasantry in the basin of Areachon, in Gascony, with which he had been familiar since the year 1818. In 1843, M. Léon Marechant† reported officially on the prevalence of the same affection in the district of Les Landes, at the mouths of the Gironde and Adour; and subsequently MM. Calès and Roussilhe‡ stated it to be endemic in Haute Garonne and Aude. More recently, it has been ascertained occasionally to occur in other districts of the south and centre of France, and rarely in some portions of the north. The Asturian disease is now also generally recognised as being the same affection.

Within the last few years the disease has been the subject of treatises published in Italy by Ballardini and Lussana, and in France by Brierre de Boismont§ and Roussel;|| and Memoirs have appeared by M. Costallat¶ on the cause of the affection, by M. Landouzy,** on its occurrence sporadically, and by M. Baillarger†† on the paralysis which appears in its last stages.

The term pellagra, by which the disease is now generally known, is supposed to be derived from *pellis* and *ἄγρα*, a seizure; but it seems quite as likely that it might have been adopted from *pellis* and *agria*, wild—an epithet which might readily be applied to the skin affection.

The disease is described as displaying three stages:

1. It usually appears in the spring with a slight febrile attack, which is followed after two or three days by an eruption of red spots—"taches," as it was described to me, or of erythema, as it is also termed—on the backs of the hands and the front and top of the chest, and on the feet and ankles. There is usually also some disorder of the digestive organs, especially diarrhœa, and vertigo or headache at the time; and the affection subsides and passes off with desquamation after a longer or shorter period, usually at the commencement of summer. Generally, however, the disease recurs with greater severity the following spring; and so, after successive relapses and recoveries, fixes itself in the system.

2. In the second stage all the symptoms are more severe and more

* Roussel: see also report communicated by M. Lalesque, *Bullet. de l'Acad. Roy. de Méd.*, tom. i. 1836, p. 440, and tom. ii. 1837-8.

† Roussel: Report by M. Jolly in the *Bullet. de la Acad. Roy. de Méd.*, tom. x. 1844-5, p. 788, in which abstracts are given of the notices of these several observers.

‡ Roussel.

§ *Ac. des Sc.*, 1830.

|| *De la Pellagra*, par Théophile Roussel, Paris, 1845. In this work a full exposition, historical, descriptive, and ætiological, is given of the disease.

¶ *Annales d'Hygiène publique*, deuxième série, tom. xiii., 1860.

** *Bullet. de l'Acad. de Méd.*, 1852.

†† *Mém. de l'Acad. de Méd.*, tom. xiii. p. 707, 1847. In the article *Pellagra*, &c., in the *Traité de Géographie et de Statistique Médicale*, of M. Boudin, tom. i. p. 290, Paris, 1857; and that in the *Diet. d'Hygiène Publique* of M. Tardieu, deuxième édition, tom. iii., p. 228, Paris, 1862, there are good accounts of the disease and of its supposed causes. The latter also contains an extensive bibliography.

persistent. The skin affection is no longer a mere redness followed by desquamation, but the epidermis becomes dark and thickened, and has a tendency to exfoliate, leaving under it a peculiarly thin and transparent cuticle; occasionally, also, there are vesicles, pustules, or fissures on the affected parts, from which secretions exude, and becoming dry, form crusts. The gastro-intestinal symptoms are more marked—there is a morbidly acute appetite, a red and fissured but not generally coated tongue, and the bowels are much relaxed. There is pain down the course of the spine and in the limbs. The nervous power also is impaired, so that there are tremors of the extremities, with headache and vertigo, a very desponding state of mind, and not unfrequently delirium, together with emaciation and weakness.

3. In the third stage the affection becomes persistent. The skin may either display the thick and dark epidermis, or there may be fissures and crusts, or the eruption may have entirely disappeared, and the only appearance of it left may be the thin and transparent cuticle. The patient's strength is now very greatly exhausted, and he is thin and sallow. The appetite is generally voracious; he has constant diarrhoea; suffers from excessive despondency or maniacal excitement, and ultimately sinks into a fatuous condition. There is increased tremulousness of the extremities, with more or less complete loss of the power of movement. Ultimately the powers of deglutition and speech may be affected, and usually he has impairment of the common sensation, or of the sense of sight. In this way he rapidly or more gradually sinks, death being sometimes preceded by dropsical effusions into the large cavities, or by convulsions, and too frequently accelerated by suicide.

The form of insanity which supervenes in pellagra may be either mania, melaucholia, or dementia. Of 310 cases admitted into San Servolo in the five years terminating 1861, 82 were cases of mania, 2 of monomania, 95 of melancholia, and 130 of dementia. It is said that the tendency is especially to commit suicide by drowning, and that in some cases a homicidal inclination is shown towards those to whom the patients are attached, especially their children. The general paralysis which attends the last periods of the disease, and which has been described as a fourth stage, has been shown by M. Ballardini and M. Baillarger, to be identical in its symptoms and morbid appearances with the general paralysis of the insane.

During my visit to Italy, I had not any opportunity of seeing pellagra at its commencement. Indeed, the patients in that stage rarely enter the hospitals; but many cases in the second and third stages were shown to me. In the last periods of the disease the appearance of the patients was most characteristic. Their expression of countenance was usually desponding; they were thin and emaciated, pale and sallow, with sunken and glassy eyes, pale lips and tongue, and the latter was usually clean but fissured. The pulse was uniformly feeble and slow, 60 to 70 in the minute; the extremities cold, tremulous, and almost powerless. Some could not raise themselves or walk; were incapable of leaving their beds; or were secured in chairs; but others, who possessed greater power, when they attempted to

walk, did so with a tottering step, with their heads bent forwards, their backs curved, and in a kind of run, as if constantly on the point of falling.

The duration of the disease varies greatly, but it is usually two or three years, and often much longer, and the several stages may each be much prolonged. Calderini, whose work I have not seen, but from whom Boudet and Tardieu have quoted extensively, states that of cases observed at the Hospital at Milan, 114 had existed for periods varying from one to three years, 138 from three to twelve years, and 100 cases from 12 to 60 years.

Pellagra is essentially a disease of the rural districts. From a table published by Ballardini of the patients labouring under pellagra in the Milanese Provinces in the year 1856,* it appears that of the whole number, by far the larger proportion, 89·5 per cent. were peasants, 7·7 per cent. were artisans, and 3·6 per cent. followed other occupations. It was at one time supposed that the disease was contagious, but this idea is now entirely abandoned. M. Tardieu states that Buniva inoculated himself and several other persons with the saliva, blood, and fluid from the fissures in the skin, without communicating the disease. It is, however, generally regarded as hereditary. Calderini states that of 184 families comprising 1319 individuals, inheriting predisposition to the disease, 648 were affected, and 671 were healthy; and it is supposed that the mother more generally conveys the disease than the father. I found the influence of hereditary predisposition admitted by all the medical men with whom I conversed. The disease affects both sexes and all ages. In all the hospitals into which both males and females were admitted, there were cases in persons of both sexes; and in the same ward at Venice, I saw a man of sixty and a boy of twelve in the second stage. The table given by Ballardini states the age and sex of the whole of the pellagrose persons, and from this it appears that there were 1·28 men to 1 woman. As to age, 4·1 per cent. were between one and ten years of age; 9·04 between ten and twenty; 14·3 between twenty and thirty; 23·05 between thirty and forty; 27·3 between forty and fifty; 16·7 between fifty and sixty; while 9·2 per cent. exceeded sixty years of age. The value of these statements cannot, however, be fully understood from the absence of any report as to the numbers of the sexes and of the several ages in the population at large, so as to enable a comparison to be instituted.

When death takes place, it is often from the exhaustion connected with the continued diarrhoea, and this is so characteristic that it has received the name of marasmus pellagrosus, or tabes pellagrosa. In such cases, it is stated that there are not usually any evidences of disease in the intestinal tunics beyond some redness or congestion and a peculiar thinning, of the mucous membrane. Death also is frequently the result of the cerebro-spinal affection, and effusions of serum beneath

* *Annali Universali de Medicina*, anno 1860, vol. clxxiii., serie quarta, vol. xxxviii. p. 410. Milano, 1860.

the arachnoid, in the ventricles, or into the spinal canal, with softening of the brain or spinal cord, are then usually detected.

It does not appear that the patients frequently suffer from phthisis, and, indeed, it is said that the pellagrose have a remarkable freedom from scrofulous affections. I did not, in any of the cases which I examined, find the cervical glands enlarged, or detect evidences of tubercles or other lesion of the lungs on auscultation and percussion.

I also frequently inquired as to the occurrence of renal disease; the peculiar aspect of the patients, and the serous effusions which generally precede death, indicating the probability that such a complication might obtain, but was informed that it was not the case. I also failed to ascertain that attention had been directed to the condition of the supra-renal capsules, though the dingy appearance of the skin excited suspicion that those bodies might in some cases be affected.

The importance of this disease in the North of Italy can hardly be overstated. It is diffused more or less extensively over the whole country, and in certain districts its prevalence is very great. During my visit, the cases in the hospitals were comparatively few in number, but I found several patients in every hospital which I visited, and my conductors uniformly stated that during the months of July and August, they formed a large proportion of those under treatment.

From the table published by Ballardini, it appears that in 1856 there were 1149 pellagrose patients under treatment in the various hospitals and asylums of the Milanese provinces. I am unable to furnish a statement of the number of other cases under care during the same period; but there can be no doubt that the proportion of the pellagrose must have been very large.

The table,* however, affords conclusive information as to the general prevalence of the disease. It appears that the total number of pellagrosi in the country in 1856 was 37,628, or 16·3 per 1000 of the entire population. The disease varies, however, in frequency in different districts. The pellagrose constituted only 0·3 per 1000 of the population in the province of Sondrio, 3·4 in Lodi, and 5·04 in Como, while they rose to 22·01 in Bergamo, and 34·3 in Brescia; the province of Milan occupying the next place to Bergamo.

Not only is the disease prevalent, but its effects are most serious.

Of the whole number of cases, 29,476 only were cured, or 78·3 per cent., while 5657 remained uncured, or 15·3 per cent.; 3390, or 9 per cent., had mental affections connected with the disease; 110, or 0·029 per cent., committed suicide; and 2385, or 6·3 per cent., died naturally. The rate of mortality, like the prevalence of the disease, varied greatly in different districts. It was 3·43 in the province of Mantua, 12·07 in Pavia, 13·26 in Brescia, and 47·85 in Sondrio, the rate

* In the hospital at Milan alone, it appears from a table published by Calderini and M. Roussel, that in the eleven years from 1832 to 1842 inclusive, the number of patients treated amounted to 6993, giving an average of 636 nearly each year. In 1839 the number reached 860, in 1837 it was only 388.

being, however, probably accidentally large in the latter province from the small number of cases which occurred.

Of the prevalence of the disease in Lombardo-Venetia I have not been able to obtain equally conclusive statements, but from the reports of the hospital San Servolo, at Venice, it appears that of 1314 cases of different forms of insanity under treatment in the five years terminating in 1861, 411 were cases of pellagra, or 31·2 per cent., or 1 to 3·2 nearly. The pellagrosi constituted 93 out of 370 persons admitted into the hospital in the year 1861, and patients were admitted with the disease from all the provinces, except that of Rovigo, the proportion to the population being largest in Treviso, Venezia, and Vicenza. The prevalence of the disease is also generally regarded as being decidedly on the increase. From a table published by Calderini,* it appears that in five years and a half, from 1832 to the end of the first half of 1837, the cases treated at the hospital at Milan were 3314 in number. In a second period, or from the second half of 1837 to the end of 1842, the number was 3679, or 379 more, but the other cases under treatment were more numerous during the second period. The proportion of cases of pellagra to all those under treatment was in the first period 1 to 31·85; in the second 1 to 30·91. At San Servolo there was little difference in the proportion of the pellagrose treated during the fifteen years embraced in the reports. In the first ten years they were as 1 to 3·064, in the last five years as 1 to 3·197.

In France also the disease is very prevalent in certain districts. M. Léon Marchant estimated the number of pellagrose individuals in the department of Les Landes at 3000.

It becomes, therefore, an object of the greatest interest to the Italian and French Governments that the causes of the disease should be investigated, in order that, if possible, they may be removed, and a stop put to the wholesale destruction of life and usefulness which it entails. Indeed, the victims of the disease in its more advanced stages, can scarcely fail to excite the sympathy of all who observe them.

What, then, are the causes which conduce to the production of pellagra?

1st. From an early period it has been supposed to be due to the depressed state of the peasantry in the plains of Lombardy, and in France it has obtained in certain districts the name of "Mal de misère; and there is sufficiently conclusive proof that the rural population in the districts where it obtains are very generally in the most indigent circumstances. A report was published in 1847 of the results of an investigation of the causes and prevalence of pellagra in the States of Sardinia, instituted by the Scientific Congress. From this, as quoted by M. Boudin, it appears that of 674 pellagrose persons, 487 were in a state of most complete indigence, 142 were poor, and 45 only were in comfortable circumstances. We can only, however, accept poverty as an accessory, not as an essential, cause of the

* Roussel : *op. cit.*, p. 21 ; and *Gaz. des Hôpitaux*, 1843.

disease, for the population of other parts of Italy and of other countries are equally indigent, without suffering in a similar way.

2ndly. A second cause which has been assigned for the development of pellagra, is the malarious character of the country, and this cause certainly does operate in the pellagrose districts. Rice is extensively cultivated, and the country is intersected in every direction by canals of irrigation, and intermittent and remittent affections are prevalent. But there are other parts equally or even more unhealthy than Lombardy, where the disease is little if at all known; and the investigation by the Sardinian commission showed that the residences of the pellagrose patients were by no means always unhealthy—indeed, of 647 cases, nearly half, or 300, resided in healthy localities.

3rdly. Exposure to the rays of the sun has also been supposed to give rise to the disease.* The appearance of the local affection on the exposed parts of the body, and the commencement of the disease generally at the period of the year when the sun's rays are becoming powerful, and the out-door work is most actively followed, would appear to indicate that this cause is influential. But the occurrence of pellagra only in certain districts of Italy, and these not the hottest, and its appearance also in the south of France and north of Spain, while it does not occur in tropical countries, precludes us from regarding insolation as acting more than the part of an exciting cause. That, however, it does so far conduce to the disease, has been conclusively shown.

4thly. Peculiarities of soil and climate have also been supposed to conduce to the disease; but it prevails in districts too remote and too diverse, both in geological and meteorological characters, for such to have much effect in its production. It is impossible that there can be a greater contrast than between the rich and damp plains of Lombardy, and the arid and barren district of Les Landes.

5thly. The character of the drinking waters, the habits of the peasantry, and the construction of their dwellings, are also too varied in different localities to afford satisfactory explanations of the existence of the disease.

6thly. None of these opinions can therefore be regarded as sufficient to explain the production of pellagra. The opinion most generally received in Italy at the present day is, that it is connected with the use, almost exclusively, as an article of food, of the maize or Indian corn, upon which, in the form of polenta (or the flour mixed with hot water and boiled till nearly solid), the peasants chiefly live. Whether the maize was originally introduced into Europe from Mexico, as has been generally supposed, or whether it had been long known in the East, and was introduced from Arabia (as indicated by its Italian and French names of "Grano Turco," "Blé de Turquie"), is of little importance, for it seems well ascertained that it was first cultivated in Spain in the fifteenth century, and did not become common in that country till the sixteenth or seventeenth. In Italy it ap-

* This view is maintained in the Report of M. Jolly.

pears to have been introduced about the same period, but was not extensively cultivated till the seventeenth and eighteenth centuries. In France it has been grown largely only during the last and present centuries. These periods correspond with the times at which pellagra was first noticed as prevailing in these several countries; and the increasing frequency of the disease is in accordance with the more general cultivation of the grain and the extent to which it has come to constitute the food of the people.* It is true that some of the writers on pellagra, and especially those at the earlier period, have contended that the disease was not of such recent appearance; but the facts on which they supported this view were both few and indecisive, and the idea has not gained ground. Indeed, the slight allusion to the disease in the work of Ramazzini, published at Padua in 1700, seems conclusive on the point. Had pellagra been then as prevalent as at present, that writer could not have failed to have devoted more attention to it.

It has been already shown that the disease is especially common in the provinces of Brescia and Bergamo, and we are told† that in these districts the consumption of Indian corn is so large, that while much is grown, the grain is also largely imported from the adjacent countries. The peasantry, indeed, live almost exclusively upon polenta, with the addition of innutritious vegetables—cabbages, leeks, onions, radishes, and pumpkins—and take for beverage bad wine, while from poverty they sell the milk and eggs, which are the produce of their farms. From the Sardinian report it appears that of 626 pellagrose persons, 522 lived upon scarcely any other food than maize, and 104 took it, though not exclusively. It seems, therefore, most probable that pellagra is connected in some way with the use of maize as the main article of diet, but it is not clear why the grain produces the disease.

It has been supposed that it is the deficiency of nutriment, and especially of the azotized elements, in the Indian corn, and this view I found to be that entertained by all the medical men whom I questioned on the subject. It has, however, been ascertained that the proportion of azotized matter is considerable;‡ and it is stated that in certain districts of Italy, as in the south, and in Sardinia, and in Burgundy in France, the grain is extensively, or almost exclusively, used as an article of food, without producing injurious effects.§ We know, too, that in India large numbers of the population live entirely upon rice and vegetable food without suffering from any similar disease.|| It has therefore been contended that it cannot be the absence of nutriment in the maize, or the grain as such, which produces the disease, but must be some change which it occasionally undergoes, either during growth or after being harvested. The sub-

* Roussel : op. supra cit., p. 160, and Ballardini.

† Roussel and Boudin.

‡ Roussel, p. 216.

§ Valleix : Guide du Médecin praticien, 4me édition, tom. v. p. 550. Paris, 1861.

|| According to Dr. Forbes Watson, the proportion of carbonous to nitrogenous matter is in wheat as 6 to 1, in maize as 8.5 to 1, and in rice as 11.1 to 1.—Markham's Peru and India.

ject has been carefully investigated by M. Ballardini in Italy, and M. Costallat in France, and they conclude that the disease is due to changes in the grain from imperfect drying after being gathered. It is stated that when the maize is cultivated in climates, from their dampness and coldness not altogether suited to it, as in from the forty-second to the forty-sixth degrees of latitude, it cannot be fully ripened, and when placed in the granaries, without being previously dried artificially, becomes affected by a parasitic growth. M. Ballardini states that the growth appears in the oblong groove, covered by a very fine epidermis which corresponds to the germ, and beneath this is seen a greenish matter of a powdery character. Under the microscope it appears to consist of small globules, perfectly round, diaphanous, and without sporidiales internally, and of smaller size than the irregularly-shaped cells of the farina. Cessati, who first detected the parasite, has termed it *sporisorium maydis*, and his description is confirmed by M. Robin.*

If this view be correct, it explains the circumstances mentioned above, that the disease is not generally met with in the more genial climates of Southern Italy or Sardinia; nor in Burgundy, where the grain is dried in kilns or ovens before it is housed. It also accords with the ascertained fact of the greater prevalence of pellagra in cold and damp seasons,† and with the occasional occurrence of a similar form of disease—as shown by MM. Roussel and Landouzy—in persons who have not fed upon maize. For if the disease be the result of changes in the grain after it is harvested, a similar affection may be supposed to occur from the use of other grains which have been similarly affected. It seems, therefore, most probable that this theory affords the true explanation of the mode in which the use of maize gives rise to the disease. There can, however, be no doubt that other causes conduce to the effects. The defective nutriment contained in diet wholly of vegetable food, and the wretchedness of the dwellings and malarious character of the localities inhabited by the peasantry, by deteriorating their general power, must powerfully predispose them to suffer from any morbid cause, and impart to disease developed under such circumstances a peculiarly intractable character.

If the view as to the cause of pellagra which is here adopted be correct, it will appear that means of prevention may readily be resorted to. 1st. It is probable that improvements might be introduced in the cultivation of the soil, so as to secure the more perfect growth of the maize. 2nd. The plan employed in Burgundy, of drying the grain in the kiln immediately it is reaped, should be substituted for simple exposure of it to the sun, under the eaves and on the south sides of the chalets, which is now adopted in the Tyrol and Lombardy.

* Roussel, p. 197. Tardieu.

§ It is also in accordance with the fact that of the two varieties of Indian corn cultivated in Italy, it is thought to be the autumnal form—that harvested in September and October, or the “*quarantino*”—which is injurious: not the summer corn—that reaped in July and August—the “*cinquantino*.”

3rdly. The diet of the peasants should be less exclusively composed of vegetable food, and of this grain in particular.

It is stated, indeed, that when rice or other grain is consumed with the maize, the disease is prevented, and the prevention would doubtless be still more complete were animal food also taken. I found the medical men all agreed that tonic treatment—quinine and iron, with good food and a portion of soup or other form of animal food, and good wine—were the most beneficial. Under such a system many persons get well, and if they remain in the cities where the diet of the people is less exclusively vegetable, they often escape any further symptoms of the disease; but if they return to the habits of the country and to their former diet they almost always relapse.

Cerri, at the beginning of the century, was led to employ a nutritious diet in the treatment of pellagra, and found not only that it cured the existing attack, but prevented the usual relapse in the following spring. An opposite treatment has, however, been tried, and from a table of the results of the practice of different physicians published by Lussana, it is seen that at the hospital at Milan,* when antiphlogistic measures were practised in 1827, the mortality was 24·5 per cent.; and the cases becoming chronic 55·6 per cent. In from 1849 to 1852, still under antiphlogistic treatment, the mortality was 28·3, and the chronic cases 38·4. When a mixed course was followed, from 1849 to 1851, the mortality was only 6·6, and the chronic cases 32·8; and when a purely restorative system was adopted in 1852, the mortality sank to 4·5, and the chronic cases to 20·9 per cent. The number of cases tabulated is so large (9066) that these calculations may be fairly accepted as representing the advantages of the several kinds of treatment.

From the extremely anæmic appearance of the pellagrose patients, and the malarious character of the countries which they inhabit, iron and quinine would certainly seem to be the most important remedies. Baths, sulphurous and others, have been found beneficial for the skin affection.

Writers have differed as to the place which should be assigned to Pellagra in systematic classifications. Sauvages and Cullen, in accordance with the views of Casal and Thierry, placed the Asturian disease in the class *cachexiæ*, and order *impetigines*, under the term *Lepra Asturiensis*; Good placed Pellagra in the class *hæmatica* and order *dysthetica*, as *Elephantiasis Italica*; and the majority of writers have regarded the affection as a form of *lepra* or *elephantiasis*. Alibert termed it *Ichthyosis Pellagra*. It, however, certainly differs widely from these classes of disease; and if the theory here advocated be the true one, the affection must be classed among the poisons, or intoxications of the French writers, and be regarded as bearing a close analogy to ergotism, though the result of a change occurring in

* *Annali Universali*, anno 1859, vol. clix. (serie quarta, vol. xxxiii.). Milano, 1859, p. 514.

the grain after it is housed, not during growth. Guerreschi, adopting this view, termed it *raphania maistica*, but that term refers to a result of the disease, not the disease itself. The nervous affection, also, is rather paralytic than convulsive. The disease would appear to consist in a morbid condition of the blood, entailing subacute inflammation of the mucous membrane of the alimentary canal and of the membranes of the brain and spinal cord.

It must not, however, be supposed that pathologists who have studied the subject are agreed as to the ætiology of pellagra. So far to the contrary, able and careful investigators have arrived at very opposite conclusions. M. Courty, of Montpellier, after a full consideration of the evidence brought forward in favour of the dependence of the disease upon the use of diseased maize, concludes that if there be any one essential cause, such has not as yet been discovered, and that the disease probably originates in a variety of causes, and constitutes in the widest sense of that term, a "*mal de misère*." M. Boudin regards the prevalence of pellagra in districts in which maize is the chief article of food as a mere coincidence; and M. Landouzy also denies its dependence on the use of maize. On the other hand, the views of Ballardini and Roussel are strongly upheld by M. Costallat. M. Tardieu is disposed to support them, and the weight of evidence certainly seems in favour of their correctness.

The subject is involved in great difficulties from the diseases of many of the various countries in which maize is used being so little known. The subject has, however, been offered as a prize by the Académie de Médecine, and conclusive information will doubtless, in no long time, be obtained.

THE END.

LONDON :
SAVILL AND EDWARDS, PRINTERS, CHANDOS STREET,
COVENT GARDEN.

